AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Research Article

ASSESSMENT OF *VEERYA* OF SELECTED MEDICINAL PLANTS USING EXOTHERMIC AND ENDOTHERMIC REACTIONS: AN EXPERIMENTAL STUDY

Kajal Choudhary[1]*, Rashmi Srivastava[2], Tanvi Sood[3], Sunidhi Kundal[1]
*[1]PG Scholar, [2]Professor, [3]Lecturer, Department of Dravyaguna, RGG PG Ayurvedic College and Hospital, Paprola, Himachal Pradesh, India.

Article info
Article History:
Received: 09-11-2025
Accepted: 21-12-2025
Published: 20-01-2026
KEYWORDS:
Veerya, Ushna-Sheeta, Exothermic reaction, Endothermic reaction, Medicinal plants.

ABSTRACT

Veerya, the inherent potency of a *Dravya*, is the dynamic principle that enables it to express its therapeutic action. In Ayurveda, Veerya is considered a decisive factor that governs the *Karma* (action) of a drug and is primarily classified as *Ushna* (heating) or *Sheeta* (cooling). A substance that loses *Veerya (Nirveerya)* becomes pharmacologically inactive, highlighting the importance of this property in clinical application. The present study evaluates thirteen Ayurvedic medicinal plants described in classical texts. Exothermic and endothermic reactions are used as simple experimental tools to observe the energetic behaviour of each plant, providing supportive insight into the Ayurvedic classification of *Veerya*. This approach bridges traditional concepts with measurable thermodynamic responses, allowing better understanding of the potency of these medicinal plants.

INTRODUCTION

Veerya (potency) is a central concept in Ayurveda pharmacodynamics that determines the therapeutic action of a *Dravya*. While classical literature describes *Veerya* as *Ushna* or *Sheeta*, modern scientific viewpoints suggest that these attributes may be understood through heat-releasing and heat-absorbing reactions, aligning traditional pharmacodynamics with thermodynamic principles. Chemical reactions are categorized by their energy exchange with the surroundings. Exothermic reactions release heat and are associated with a negative enthalpy change ($\Delta H < 0$), whereas Endothermic reactions absorb heat and show a positive enthalpy change ($\Delta H > 0$). Heat-releasing behavior may be indicative of *Ushna Veerya*, while heat-absorbing behavior may correspond to *Sheeta Veerya*, offering a thermodynamic perspective to drug potency. the present study examines thirteen medicinal plants described in classical texts, aiming to observe their energetic responses through simple laboratory analysis. By analyzing these thermodynamic patterns, the study attempts to correlate measurable energy responses with the Ayurvedic classification of *Veerya*. Photosynthesis exemplifies this type of reaction, where plants use sunlight to convert carbon dioxide and water into glucose and oxygen [1]. Several previous studies have attempted to correlate *Veerya* with measurable scientific parameters. *Tulsi (Ocimum sanctum)* has been particularly informative in linking traditional potency with energetic behaviour.[2] This work, along with other studies, has been used only as a reference source for conceptual support.

Access this article online
Quick Response Code
https://doi.org/10.47070/ayushdhara.v12i6.2369

MATERIALS AND METHODS

Exothermic reaction for *Veerya* analysis

Authentication and Procurement: Thirteen Ayurvedic drugs described in classical texts as having either *Ushna Veerya* (hot potency) or *Sheeta Veerya* (cold potency) were selected for this analytical study. All samples were authenticated and procured from the Department of Dravyaguna, RGG PG Ayurvedic College and Hospital, Paprola, Himachal Pradesh. Authentication was carried out by departmental experts using standard Pharmacognostic procedures to ensure genuineness and purity.

Procedure: 10ml of distilled water was measured into three identical glass beakers.

2 Initial Temperature Recording: Baseline temperature of water was recorded at 2, 4, and 6 minutes using a calibrated digital thermometer with stainless-steel probe.

3. Sample Addition: 10 g of coarse powder of each drug was added separately to the beakers containing distilled water.

4. Observation: After gentle stirring, temperature readings were again taken at 2-minute intervals (2, 4, and 6 minutes) after addition.

Table1: Latin name along with *Veerya* of Drug

S.No	Name of Drug	Latin Name	*Veerya*
1	*Haritaki*	*Terminalia chebula* Retz.	*Ushna* (Hot) [3]
2	*Sunthi*	*Zingiber officinale* Roxb.	*Ushna* (Hot) [4]
3	*Methika*	*Trigonella foenum-graecum* Linn.	*Ushna* (Hot) [5]
4	*Haridra*	*Curcuma longa* Linn	*Ushna* (Hot) [6]
5	*Coffee*	*Coffea arabica* Linn	*Ushna* (Hot) [7]
6	*Marich*	*Piper nigrum* Linn	*Ushna* (Hot) [8]
7	*Atasi*	*Linum usitatissimum* Linn	*Ushna* (Hot) [9]
8	*Yavani*	*Trachyspermum ammi* Linn	*Ushna* (Hot) [10]
9	*Pippali*	*Piper longum* Linn	*Ushna* (Hot) [11]
10	*Vidarikand*	*Pueraria tubersosa* DC.	*Sheet* (Cold) [12]
11	*Arjun*	*Terminalia arjuna* Roxb	*Sheet* (Cold) [13]
12	*Chandan*	*Santalum album* Linn	*Sheet* (Cold) [14]
13	*Madhuyashti*	*Glycyrrhiza glabra* Linn	*Sheet* (Cold) [15]

Result

Fig 1: Sample Drugs of *Ushna Veerya* Fig.2 Sample Drug of *Sheeta Veerya*

Fig 2: Illustrates the sieving of the drug using an 85- mesh sieve

1. *Haritaki*

a. 2min b. 4min c. 6min

Fig 4. Digital thermometer and its readings of samples in the experiment

Table 2: Exothermic and Endothermic reaction of Ayurvedic drugs

S.No	Drug	Media Temperature			Sample Temperature		
		After 1 minutes	After 3 minutes	After 6 minutes	After 1 minutes	After 3 minutes	After 6 minutes
1	*Haritaki*	76.6°F	76.6°F	76.6°F	76.8°F	76.8°F	77.0°F
2	*Sunthi*	76.6°F	76.6°F	76.6°F	76.7°F	76.9°F	77.1°F
3	*Methika*	76.6°F	76.6°F	76.6°F	77.0°F	77.0°F	77.2°F
4	*Haridra*	76.6°F	76.6°F	76.6°F	77.1°F	77.1°F	77.4°F
5	Coffee	76.6°F	76.6°F	76.6°F	76.8°F	77.0°F	77.3°F
6	*Marich*	76.6°F	76.6°F	76.6°F	77.0°F	77.2°F	77.4°F
7	*Atasi*	76.6°F	76.6°F	76.6°F	77.8°F	77.8°F	78.0°F
8	*Yavani*	76.6°F	76.6°F	76.6°F	76.7°F	76.8°F	77.0°F
9	*Pippali*	76.6°F	76.6°F	76.6°F	77.0°F	77.0°F	77.4°F
10	*Vidarikand*	76.6°F	76.6°F	76.6°F	73.8°F	73.8°F	73.8°F
11	*Arjun*	76.6°F	76.6°F	76.6°F	74.6°F	74.6°F	74.0°F
12	*Chandan*	76.6°F	76.6°F	76.6°F	72.8°F	72.4°F	72.4°F
13	*Madhuyashti*	76.6°F	76.6°F	76.6°F	73.6°F	73.4°F	73.4°F

DISCUSSION

Thermometric assessment of thirteen Ayurvedic drugs revealed temperature variations consistent with their traditionally described Veerya properties. Drugs showing a temperature rise of 1°–4°F From above table 2 exhibited exothermic reactions, confirming *Ushna Veerya* (hot potency). Conversely, drugs with *Sheeta Veerya* (cold potency) showed a temperature drop of 2°–4°F, while water (control) remained at 76.6°F. Substances with minimal or negative temperature changes demonstrated endothermic behavior, reflecting their inherent cooling potency. These results suggest that the classical concept of *Veerya* can be interpreted through thermodynamic principles, where measurable heat exchange indicates the energetic potential of a substance.

In the present study, a fixed ratio of 10 g of drug with 10ml of water was used. However, it was observed that the particle size of the drug plays a crucial role in effective interaction with the medium. Finely powdered drugs may agglomerate, whereas coarsely powdered material allows better dispersion and uniform heat exchange, thereby influencing the observed thermometric response. This highlights particle size as an important variable that needs standardization. The 10:10 ratio was selected to maintain a consistent mass–volume relationship, allowing observable heat exchange in harmony with basic thermodynamic principles, particularly heat transfer between system and surroundings. Still, the absence of standardized protocols limits precise quantitative interpretation.

Use of a 1:10 drug-to-water ratio (1g:10ml) results in the drug quantity being too small relative to the solvent, causing the heat evolved or absorbed by the drug to be diluted by the high thermal mass of water. Owing to water's high specific heat capacity, even when heat exchange occurs, the resulting temperature change may be minimal and fall within experimental error, leading to masking of subtle Exothermic or Endothermic responses and possible misinterpretation of *Veerya*. This can be explained by the heat equation ($q=mc\Delta T$), where a higher mass (m) of water produces a smaller change in temperature (ΔT) for a given heat exchange (q). Therefore, a more balanced ratio, such as 10g drug: 10ml water, allows clearer, measurable, and reproducible thermometric responses.

CONCLUSION

Therefore, the present approach should be considered as providing a qualitative indicator of *Veerya* rather than a direct measure of Pharmacological activity. Further studies with controlled particle size, varied ratios, advanced calorimetric methods, and standardized experimental conditions are necessary to strengthen and validate this thermodynamic interpretation of *Veerya*.

REFERENCES

1. Helmenstine AM. Endothermic and exothermic reactions: enthalpy, entropy and spontaneity [Internet]. Available from: http://chemistry.about.com/cs/generalchemistry/a/aa051903a.htm. Accessed 2014 Sep 28.
2. Naik PM, Nayak SU. Exothermic reaction for Veerya analysis of Rakta Punarnava (Boerhavia diffusa Linn.) - an experimental study. Int J Med Sci Clin Inventions. 2014; 1(10): 555-8. Available from: http://valleyinternational.net/index.php/our-jou/ijmsci.
3. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 735
4. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 331.
5. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 823.
6. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 162.
7. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 216.
8. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 362.
9. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 412.
10. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 494.
11. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 275.
12. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 738.
13. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 195.
14. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 715.
15. Sharma PV. Dravyaguna Vijnana. Vol. 2. Varanasi: Chaukhambha Bharati Academy; 2024: 255.

Cite this article as:
Kajal Choudhary, Rashmi Srivastava, Tanvi Sood, Sunidhi Kundal. Assessment of Veerya of Selected Medicinal Plants Using Exothermic and Endothermic Reactions: An Experimental Study. AYUSHDHARA, 2025;12(6):199-202.
https://doi.org/10.47070/ayushdhara.v12i6.2369

Source of support: Nil, Conflict of interest: None Declared

***Address for correspondence**
Dr. Kajal Choudhary
PG Scholar
Department of Dravyaguna,
RGG PG Ayurvedic College and Hospital, Paprola, Himachal Pradesh, India.
Email: kajuneuro@gmail.com